

# Science Primary CLIL: The influence of teaching and learning Science in an outdoor environment.

## AICLE en Primaria: la influencia del aprendizaje y la enseñanza de Science fuera de clase

**Título:** Science Primary CLIL: The influence of teaching and learning Science in an outdoor environment. AICLE en Primaria: la influencia del aprendizaje y la enseñanza de Science fuera de clase. **Target:** Educación Primaria. **Asignatura:** Ciencias naturales bilingüe (Science). **Autor:** Juan Pedro Tacoronte Sosa, Maestro. Especialidad Lengua Extranjera (Inglés).

### RESUMEN

El Aprendizaje Integrado de Contenidos y Lenguas Extranjeras supone abarcar distintas asignaturas en una lengua distinta a la materna. De esta manera, AICLE puede resultar muy beneficioso tanto para el aprendizaje de otras lenguas objeto de estudio como puede ser el inglés y el contenido de otras materias que incluye el currículo. El enfoque a adoptar en las distintas asignaturas va a depender de las características propias de las mismas. De cualquier modo, los aprendizajes que se produzcan deben ser significativos para que el conocimiento declarativo adquirido permanezca en las estructuras mentales del alumnado durante un periodo de tiempo prolongado. El siguiente artículo abarca de manera monográfica la influencia de aprender fuera del aula en la asignatura CLIL de Science así como los beneficios de complementar el contenido teórico de la asignatura con la experimentación y puesta en práctica de éste fuera del aula para hacer el aprendizaje significativo y sempiterno en la medida de lo posible.

### PALABRAS CLAVE

AICLE, Science, aprendizaje y enseñanza, beneficios, entorno exterior

### ABSTRACT

Content Language Integrated Learning encompasses learning different subjects in a language different to the mother tongue. In this way, CLIL can prove to be beneficial as much for the learning of the foreign language, for example English, as for the content of other subjects included in the curriculum. The approach to adopt in the different subjects will depend on the characteristics of these subjects. The learning experiences produced must be significant so that the declarative knowledge acquired remain in the students' internal mental structures for a long time. The following article tackles the influence of learning outside the classroom in the CLIL subject of Science, and the benefits of supplementing the theoretic content of the subject with the trial and putting into practice of this outside the classroom to make learning meaningful and lasting.

### KEY WORDS

CLIL, Science, learning and teaching, benefits, outdoor environment

## RESUMÉ

L'Enseignement de Matières par Intégration d'une Langue Étrangère fait aborder diverses matières dans une langue autre que la maternelle. De cette façon, EMILE peut s'avérer très avantageux aussi bien pour l'apprentissage des langues faisant l'objet d'étude, comme peut l'être l'anglais, que pour le contenu d'autres matières incluses dans le curriculum. L'approche à adopter dans les différentes matières va dépendre des caractéristiques qui leurs sont propres. Dans tous les cas, les apprentissages qui se produiront doivent être significatifs pour que la connaissance déclarative acquise demeure dans les structures mentales des élèves pendant une période de temps prolongée. Cet article aborde de façon monographique l'influence d'apprendre en dehors de la classe dans la matière EMILE de Science, ainsi que les bénéfices de compléter le contenu théorique de la matière avec l'expérimentation et mise en œuvre de celui-ci en dehors de la classe pour rendre l'apprentissage significatif et perpétuel, dans la mesure du possible.

## MOTS CLÉS

EMILE, Science, apprentissage et enseignement, bénéfices, environnement extérieur.

Albert Einstein once affirmed that 'learning is experience; everything else is just information'. Therefore, first-hand experience plays an important role in learning science. Similarly, direct observation and experimentation out of the class can help children to internalise the knowledge learnt in class. It is fundamental for children to be given the chance to make contact with and learn in an outdoor environment. The understanding of the 'environment' and phenomena around them is essential to learning. Hence, teachers ought to give children opportunities to experience the concepts taught in class and see them out-of-doors, which would be suitable for them as something that is connected both to science and to their everyday lives.

The term 'outdoor environment' has been used in a variety of ways but the one we will be coping with on this article centres on the notion that the outdoor environment is every experience that children have either out of the class or the school towards science knowledge acquisition and understanding and internalisation of concepts.

Furthermore, Millar and Osborne (1989, p. 29, cited in Braund and Reiss, 2004) state that:

*School science should aim to provide a populace who are comfortable, competent and confident with scientific and technical matters and artefact. The science curriculum should provide sufficient knowledge and understanding to enable students to read simple newspaper articles about science and follow TV programmes on new advances in science with interest.*

Consequently, 'the science teacher's goal should be to make children be interested in learning science and its manifestations which we see in the environment we are surrounded by' (Das, 1985, p. 20).

Teachers should enhance students' interest in science learning by experimenting out of the class situations. In addition, 'the science teacher should help and encourage pupils to acquire an interesting and useful acquaintance with all aspects of science important to the modern world and what the pupils learn will not be of lasting value if they do not take interest in it' (Das, 1985, p. 17-20).

The possible provision of opportunities and stimulation will be experienced through observation so there is no doubt about its functionality in learning science outdoors. Harlen and Symington (1985, p. 21) emphasise the relevance of observation stating that 'observation is the process through which we come to take notice, to

become conscious, of things and happenings' and 'our existing concepts and knowledge affect what we see or hear or feel'.

Observation and interaction are contributory concepts from Piaget theories as 'his work is based on a view that children's knowledge of a progressively more objective kind is constructed through interaction with the environment' (Driver, 1983, p. 51). 'To Piaget, learning is essentially an active process in which the learner constructs his knowledge through interaction with the environment and the resolution of the cognitive conflict which may occur between expectations and observations. In fact, it is the need to resolve the cognitive dissonance that provides the intrinsic motivation for learning' (Driver, 1983, p. 52).

It is important that Science CLIL teachers realise that the concepts and ideas could be better internalised if they are experienced and thus the outdoor environment is conducive to learning; 'they must develop interest to pursue scientific activities within the school but also outside' (Das, 1985, p. 26).

Following this line of thought, Showell (1979, p. 165) points out that 'children respond to, and learn from, their surroundings and should be given opportunities to explore beyond the classroom. There cannot be a set list of things that they should see and do... their curiosity about their immediate world can be exploited and used to their benefit'. 'As science learning has its basis in first-hand experience, teachers should provide them with resources so as them to have a perception of how things are, smell, taste, etc.' (Das, 1985, p. 159).

Indoor activities, give children an opportunity for direct experiences but children sometimes have to go out of the class for direct experiences given the fact that 'some activities are best done outside the confines of a school and there is a kind of unwritten code that causes most teachers, principals, parents and even students to assume that really worthwhile learning can occur inside a classroom' (Good, 1977, p. 281). 'A classroom 'closes in' and restricts what a person can do and learn whereas outdoors expands the potential for learning' (Good, 1977, p. 281).

Many places such as the school garden, the local museum, the zoo, field trips, outings, meteorological observatory can give direct experience to children (Das, 1985). Therefore, visits are to support pupils. They should be 'carefully prepared to support the curriculum in consultation with the company, the visit is likely to enrich and enhance children appreciation of science and its implications' (Parvin and Stephenson, 2004, p. 147). Visits can be either very useful or less useful, but if they are goal-oriented to science learning, they are worth it. It can be the step further for any study, or just the opportunity to see and learn new things (Showell, 1979). Furthermore, they have an educational function and connection with science. By contrast, schools do not provide many opportunities where children can be taken out into the environment and carry out some activities (Braund and Reiss, 2004).

It would be reasonable to assume that the environment has positive effects on children's science learning, above all in concepts internalisation. 'The outdoors can be an effective place for learners to develop an understanding of basic concepts. These basic concepts extend far beyond the acquisition of simple facts by including observation and environment practice' (Gilbertson *et al.*, 2006, p. 12). Moreover, 'there is a belief among science teachers that practical experience of phenomena is essential for understanding scientific concepts' (Monk and Osborne, 2000, p. 60). 'Throughout the experiential learning process the learner is actively engaged in posing questions, investigating, experimenting, being curious, solving problems...and constructing meaning' (Gilbertson *et al.*, 2006, p. 9).

All things considered, science is a subject that has some content and concepts that can be better taught in the class rather than out of the class. Learning science and experiencing out of the class are lifelong learning experiences that would never be forgotten. Admittedly, making an observation of wood, leaves, blossoms, fruits out of the class will result in students still remembering the differentiation between the different shapes

of leaves, texture of wood, etc. Additionally, they would also remember rocks and solids shape and forms, etc. However, many theories and principles learnt in class theoretically and not experienced could be easily forgotten either in a couple of days or weeks. Therefore, we principally consider outdoor experiences, especially in science learning, as a very important 'tool' that could be used after science theoretical explanations to complement them or to show little evidence about what taught in class. The advantages are palpable and hence that we do consider that taking children out of the class and experience things will not only improve children's knowledge but also it will contribute to their science concepts understanding in a better way.

To conclude, teaching science in an outdoor environment is very useful as it can help teachers to improve children's understanding of science concepts and children can internalise concepts in a different way whether it is in contexts such as the school garden or other places such as museums, etc. This article has outlined the influence of outdoor science teaching, learning, understanding and internalisation of concepts through experience itself and it has given a few remarks intending science CLIL teachers to make the most of the many and varied opportunities that there are for children to enrich and complement the out of the school learning of science.

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